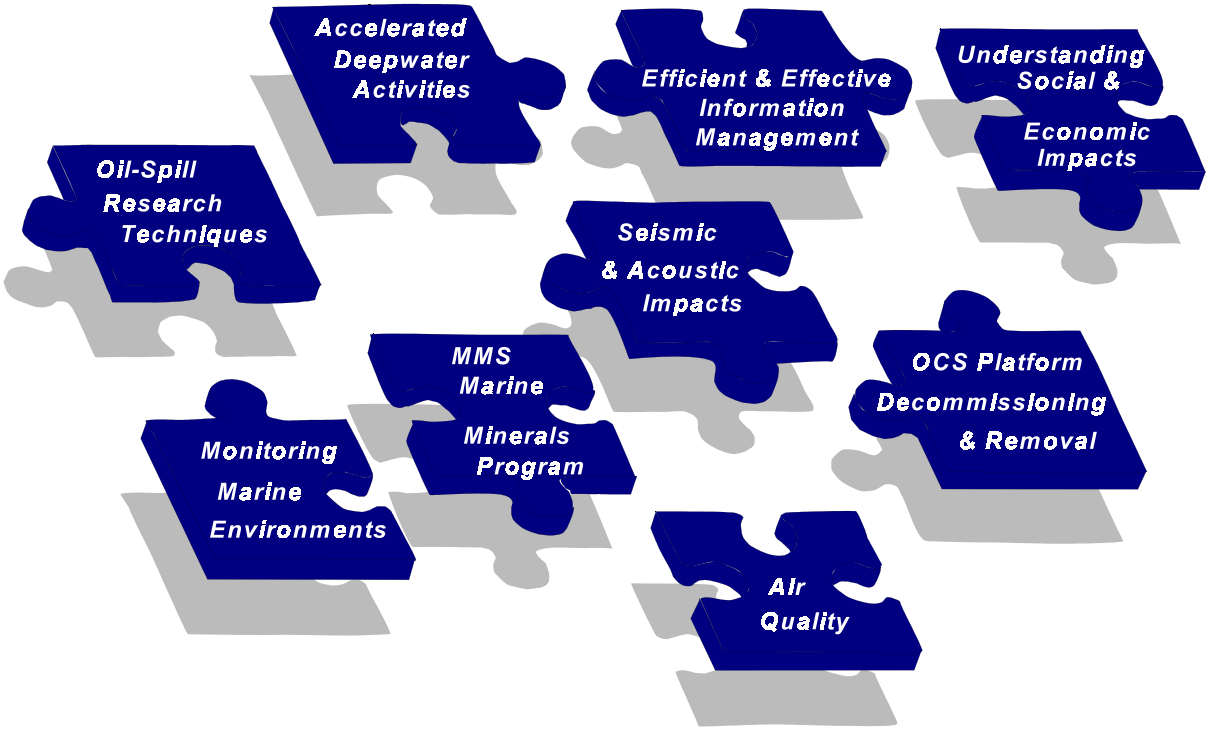
Environmental Studies Program
National Strategic Plan, 1998-2002



— MMS Research Mandate —

Establish information needed for assessment and management of environmental impacts on the human, marine, and coastal environments of the OCS and potentially affected coastal areas.

(Outer Continental Shelf Lands Act, Section 20)

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Introduction

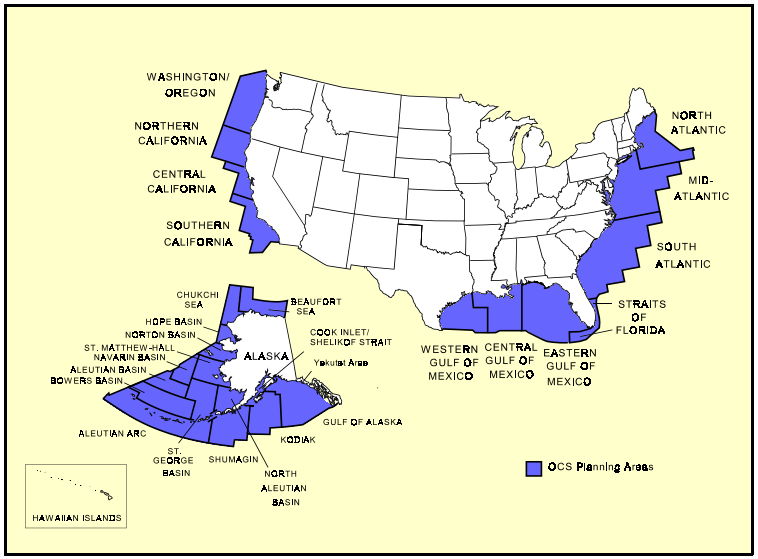
As steward of our Federal offshore lands known as the Outer Continental Shelf (OCS), the Department of the Interior and the Minerals Management Service (MMS) are responsible for balancing the Nation's search for petroleum energy and marine minerals with the protection of the human, marine, and coastal environments. The MMS's environmental programs serve this important mission by providing the solid scientific underpinnings for the critical program decisions that must, by law, accommodate this delicate balance. The MMS commitment to environmental protection begins with the first steps in the leasing process and continues through to the end of the production activity with decommissioning/removal of the production structure.

This National Strategic Plan was developed by the MMS Environmental Studies Program to identify general OCS programmatic trends and directions over the next 2-4 years. It will be updated annually to assure that future study decisions are based on a realistic understanding of emerging concerns, issues, and directions.

Environmental Studies Program

History: Established in the 1970's, the Environmental Studies Program (ESP) is a highly focused marine research program that is designed to provide the environmental information necessary for informed decisions on OCS energy and nonenergy mineral planning and development activities. The ESP supports the 5-Year OCS Leasing Program and provides the MMS decisionmakers, States, and local governments with information necessary to ensure that offshore activities, at all stages, are conducted in an environmentally safe manner.

The Minerals Management Advisory Board, previously known as the OCS Advisory Board, provides a formal mechanism for consultation with affected States and other interested parties on all aspects of leasing, exploration, development, and protection of offshore resources. As part of this Board, the OCS Scientific Committee advises MMS on the feasibility, appropriateness, and scientific value of the ESP; reviews the information produced by the ESP and may recommend changes in scope, direction or emphasis; and reflects, through its membership, a balance of scientific and technical disciplines considered important to the management of the ESP.



OCS Research Planning Areas

For the next 3-5 years, several themes shape the direction, focus and content of the ESP:

- Accelerated OCS Activities in Deepwater Areas
- Monitoring Marine Environments
- Seismic and Acoustic Impacts
- Understanding Social and Economic Impacts
- Oil-Spill Research Techniques
- Air Quality Impact Assessment
- OCS Platform Decommissioning and Removal
- Efficient and Effective Information Management
- MMS Marine Minerals Activities

Partnerships: The ESP actively seeks partnerships with stakeholders who are involved with, or affected by, the oil and gas resource management activities. Not only do partnerships result in important consensus building, but within the current environment of ever-constrained budgets, they also afford an opportunity for leveraging dollars and accomplishing research objectives that might not be attainable otherwise.

The MMS has established key research partnerships through the Coastal Marine Institute initiatives in Louisiana, Alaska, and California. In addition, several partnerships focusing on the development of Geographical Information System resources are in place with the Gulf Coast States and the National Oceanic and Atmospheric Administration.

The marine minerals program has partnered with various coastal States to locate suitable sources of offshore sand for nourishment of nearby beaches and to conduct environmental studies evaluating potential dredging impacts before any operations**.**

Cooperative, cost-sharing arrangements have also been made with other government agencies and private dredging contractors in the United Kingdom to study the potential impacts of extracting sand and gravel for use as construction aggregate. The United Kingdom currently gets approximately 30 percent of its construction aggregate from the offshore area.

Products: Recognizing the importance of quickly making studies results available to a diverse audience of information users, ESP investigators publish in peer-reviewed journals and present the status of ongoing research at MMS Information Transfer Meetings and regional, national, and international conferences. Final research reports submitted to MMS are distributed to depository libraries throughout the United States and are also available through the National Technical Information Service.

To meet the demands for rapid dissemination of information, research reports are now prepared in digital format to facilitate access through the Internet. The Environmental Studies Program Information System (ESPIS), a major information management effort , houses many of these reports and can be accessed through the MMS Homepage on the Internet. These

- Research results are available from the MMS Environmental Studies Program on-line at **http://www.mms.gov/espis**
- Completed MMS marine minerals environmental studies are on-line at **http://www.mms.gov/omm/intermar/marineac.htm**
- ESP marine environmental data are archived at the National Oceanic and Atmospheric Administration, National Oceanographic Data Center on-line at **http://seaboard.nodc.noaa.gov**.

products all form a part of the information base used by MMS analysts, and others, to conduct environmental assessments related to the management of OCS resources.

Environmental Studies Program Direction

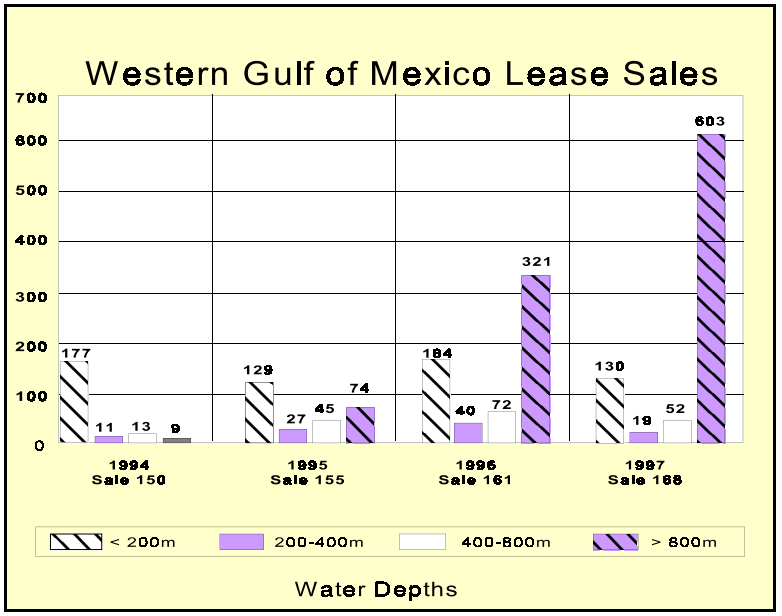
This ESP Strategic Plan addresses a wide variety of environmental concerns and issues on a national scale by identifying emerging and ongoing program areas. It complements and builds upon broader strategic plans that set Agencywide policies and directions. Within these broad issues or themes, multi-disciplined studies will be developed, as budget allocations allow.

Accelerated OCS Activities in Deepwater Areas

Objective: To expand our scientific knowledge and understanding of the biological and physical processes in deepwater environments and of the social and economic impacts resulting from accelerated OCS activities.

The Gulf of Mexico (GOM) is currently experiencing a dramatic increase in exploration and plans for development of oil and natural gas in OCS water depths in excess of 300 meters. Factors contributing to this renewed interest and exploration in the GOM include:

- passage of the OCS Deepwater Royalty Relief Act of 1995,
- recent technological advances (particularly in 3-D seismic capability), and
- significant decreases in anticipated costs for exploration and development activities.



Comparison of Tracts Receiving Bids

Between 1992 and 1997, leases in water depths greater than 800 meters have increased dramatically, comprising more than 50 percent of the total leases awarded in the Central GOM and an astonishing 75 percent in the Western GOM. Since MMS is committed to environmental protection and safety, it has a real need to know more about the geologic and environmental characteristics of this frontier area to better understand the challenges facing us.

Accelerated activities alone present problems that must be considered — increased production through pipelines, demands on port cities and highways, vessel traffic, and risks from operational discharges and spills. More information on industry activities will need to be collected to postulate potential impacts from these increases. Also, many deepwater environmental issues cannot be considered to be merely an extension of continental shelf issues, but will be new issues that must be addressed.

To focus discussions with stakeholders on some of these key environmental issues, MMS sponsored the "Deepwater Environmental Issues Workshop" in April 1997.

Workshop participants (consisting of experts from academia, industry and government) developed a broad set of scientific information needs within the physical, biological, chemical, geological, and socioeconomic sciences. Workshop deliberations considered past and ongoing studies, and recommendations from this workshop were used to plan needed studies.

To date, a limited number of studies have been conducted in the Gulf's deep waters—the strong bottom currents and intermittent subsurface currents are poorly understood. Also, chemosynthetic community studies have been conducted along the OCS in about 400 meters of water, as well as some general physical oceanographic upper current sampling. However, no studies have been designed to look at OCS activities specifically in the Gulf's deep waters to assess the differences that exist between deepwater activities and shelf activities from an operational viewpoint, as well as the ecosystem specifics.

> Use of synthetic drilling muds and large volumes of industrial chemicals to improve deepwater drilling operations may create operational discharges not previously considered. Much needs to be done to fully understand the potential impacts that could affect deep-ocean habitats.

Meeting the Need: To remedy the lack of information available in these deepwater areas, several study efforts should be undertaken.

- Studies of ocean bottom currents will need to address potential operational and oil-spill effects specific to deep water, as well as studies of deepwater benthic, demersal, and water column habitats.

- Additional information will be needed on the physical and chemical characteristics of discharged materials, particularly if industry proposes alternatives to materials commonly used on the continental shelf. Additional modeling and field studies will be needed to properly describe the fates and effects of these materials.

- New studies of currents on the GOM continental slope need to be undertaken. These studies are needed to provide information for oil-spill risk analysis and design of interdisciplinary ecosystem studies. Because of logistical considerations and the large areas under consideration, study costs will be very high.

- Social services, transportation, new labor pools, and port activities need to be assessed and monitored at local and regional levels to mitigate potential social and economic impacts of deepwater activities.

Research Needs Identified in the MMS Deepwater Environmental Impacts Workshop, April 1997

Socioeconomic Issues — Research effects of activities on ports and coastal support facilities.

Ecological Issues — Research deep benthic ecology, fauna, biomass diversity, chemosynthetics.

Physical Oceanography — Following data synthesis and modeling studies, plan intense observational program and measure circulation on the Louisiana/Texas slope.

Geohazards — Research slope instabilities, gas hydrates and sediments, and improved bathymetry.

F**isheries** — Research data on deepwater commercial fishing areas, prime feeding grounds for key species, and population densities and biodiversity.

The scope of information needs goes well beyond the mandates of the ESP. The oil and gas industry will need additional information on geology and geohazards. Industry will also require physical oceanographic measurements to support the design and placement of facilities, and the U.S. Environmental Protection Agency (EPA) will be very much involved in dialogue with industry on the use of synthetic drilling fluids.

Monitoring Marine Environments

Objective: To monitor the marine and coastal environments in a manner designed to provide the time-series and data trend information needed to identify significant changes in the quality and productivity of such environments.

Concerns continue to be expressed by environmental scientists and the general public regarding possible effects of OCS activities on the marine and coastal environment. Some of the issues concerning acute, short-term effects of OCS oil and natural gas activities have been addressed adequately through credible scientific studies. For example, studies have shown that discharges from exploratory drilling in the OCS environment would not result in significant long-term effects, except possibly in areas with rare, slowly recovering communities. However, one issue that has not been resolved is that of potential long-term, chronic effects from oil and natural gas development and production activities.

In the past, benthic (seafloor) communities have been one area of focus for monitoring the effects of OCS oil and natural gas activities. Contaminants often attach onto suspended particles, settle to the bottom, and accumulate in bottom sediments. Many benthic organisms are relatively long-lived and sedentary, making them more susceptible to effects from accumulated contaminants. However, it has been found that water column organisms, plankton and nekton, are unlikely to experience significant contaminant concentrations or exposure durations. Also, benthos can be sampled with greater statistical precision than water column organisms.

During the next several years the ESP will conduct ecological monitoring to determine the effects of oil spills on marine communities. Understanding the recovery of marine communities following an oil spill will continue to be an opportunistic study for the ESP.

Another essential means of assessing potential impacts of direct and indirect OCS activities is monitoring information on endangered and nonendangered birds and mammals. Efforts to monitor potential contaminant loading, water and sediment quality, and bioaccumulation in important marine species will be maintained.

Meeting the Need: Future MMS marine environmental monitoring studies will focus on assessing the long-term, as well as short-term, environmental effects associated with OCS production activities.

The ESP monitoring efforts will be part of the Agency's effort to not only establish result-oriented goals, but also to help measure the success of MMS-funded research and impact mitigation efforts.

- Environmental monitoring studies will include interdisciplinary efforts involving biological, chemical, geological, and physical oceanographic components designed to measure any sublethal effects caused by offshore activities.

- Other future monitoring efforts include the investigation of potential OCS impacts on marine mammal, bird, and turtle populations. The ESP will continue monitoring special habitats and communities such as the Flower Gardens National Marine Sanctuary, rocky intertidal communities on the southern California coast, and bowhead whale migration routes.

- Present and future marine environmental monitoring projects will provide information needed for evaluating exploration and development/production plans for offshore oil and natural gas resources. Information from these projects will also be used to develop and evaluate the effectiveness of lease stipulations and other environmental mitigation measures. Opportunistic monitoring of oil-spill impacts will provide information important to development of oil-spill cleanup and contingency plans.

Seismic and Acoustic Impacts

Objective: To determine potential impacts of seismic- and acoustic-related activities on marine mammals and to develop environmental review protocols.

The effect of high-energy seismic surveys on endangered and nonendangered species, specifically marine mammals, is an emerging issue on which there is limited applicable information. Seismic surveys are a component of many information gathering efforts conducted in many parts of the offshore and coastal waters. Seismic surveys use very short high-energy impulses of sound directed downwards into the seafloor, with some energy being reflected back. There is concern that these pulses, which lie towards the lower end of the range of human hearing, may adversely affect nearby marine mammals, particularly endangered species. The MMS has funded several studies on the effects of seismic noise on bowhead, gray, and humpback whales (especially in Alaska) and is looking at acoustic issues and concerns in temperate waters.

Recently in California, the MMS brought together a multi-stakeholder group (representing Federal, State, and local agencies; the oil industry;

fishermen; and environmental groups) to address their mutual concerns and information needs regarding acoustics. A workshop was formed where scientific and technical questions were addressed by an expert scientific panel. The panel was asked to assess existing acoustic knowledge and to identify key research needed to address specific issues and concerns. The information provided by the panel will be useful in developing protocols for reviewing high-energy seismic surveys proposed in the MMS OCS planning areas and in identifying future research and survey needs.

Meeting the Need:

- Maintain the MMS Bowhead Whale Monitoring Program as a means to evaluate potential effects of industry activities (production and seismic survey noises) that could impact whale migration and Alaskan subsistence activities.

- Continue participation in the Interagency Coordinating Group (ICG) (along with the National Marine Fisheries Service, U.S. Geological Survey's Biological Resources Division, Army Corps of Engineers, Marine Mammal Commission, and Office of Naval Research) whose function is to coordinate the development and assembly of seismic and acoustic information critical to the members.

Scientific Panel Study Recommendations

- Studies on overt hearing, behavioral, and physiological effects relating to sounds at or above the 180 dB $\pm$ 10 dB level for different species (focus on pinnipeds and small cetaceans).

- Studies on potential effects in the 140-180 dB range.

- Studies on the effectiveness of ramp-up procedures.

- New techniques (e.g., passive acoustic) and their effectiveness as monitoring tools.

- Baseline study to produce a compilation of information, or matrix, on species, animals, distribution, population status, and sensitivity to sound in California waters.

- A workshop formulated by the ICG will be held by the Office of Naval Research to assemble current scientific knowledge of the effects of manmade sound on the marine environment, and to identify and determine how best to fill any information gaps. Resulting guidance will be on ocean acoustics, hearing and nonhearing physiological effects, and behavioral effects. Upon completion of these tasks, another workshop led by the National Marine Fisheries Service will address the understanding of impacts and other anthropomorphic-related acoustic concerns. It is anticipated that workshop recommendations will identify study needs in the areas of acoustic criteria and impact assessment, which will ultimately assist agencies in formulating and updating regulations and guidelines.

Understanding Social and Economic Impacts

Objective: To survey, better understand, and predict the impacts of offshore activities on coastal communities and economies.

Often, assessment of the short- and long-term effects of OCS activities on the marine, human, and coastal environments, points to the impacts on social and economic structures as the first seen and the strongest felt. Opposition to offshore activities is often a result of either perceived or projected onshore impacts, whether aesthetic, structural, or economic. To better provide decisionmakers with reliable estimates and projections and possible mitigation measures, MMS has increased its socioeconomic studies nearly threefold in the past 7 years.

> The social and economic impacts of energy development are often the first felt and the most strongly experienced of any impacts. The MMS is discovering also that unlike the biological and physical environments, which usually heal relatively quickly, social and economic regimes may require a longer timeframe to recover.
>
> (paraphrased from MMS discussions with Scientific Committee at November 1997 meeting)

The downturn of the oil and gas industry in the mid-1980's highlighted the importance of regional, State, and local reliance on industry-related jobs, and revenues in both the Gulf of Mexico and Alaska. Accordingly, socioeconomic research was begun to assess the effect of that downturn in both Regions.

In the Pacific Region, the majority of recent social science efforts centered around developing liaisons with local counties to collaboratively plan for onshore effects of offshore activities.

In Alaska, the one focus of social and economic research in recent years has been to investigate the sociocultural and economic effects resulting from the early 1990's downturn of the oil and gas industry activities. Although activity within the State is on the rise, it is important to plan for any future changes.

A current challenging project for the ESP is collecting traditional knowledge of Alaskan Natives. The Alaskan Natives of the North Slope and Cook Inlet are concerned with the potential impacts of OCS activities on subsistence species and fishing grounds. They want their knowledge to be included in the efforts to evaluate OCS impacts. In recent years, there has been a growing national interest in incorporating the knowledge of indigenous people into the decisionmaking process, for both governmental and the private sectors.

Traditional knowledge is quite different, in form, content, and use, from the scientific and technical information MMS has historically used. Traditional knowledge exists primarily in an oral format, passed down through families and communities. While much has been taped, both in video and audio, a great deal of this knowledge has not been either translated or transcribed onto paper. Some study efforts will be necessary to balance Native knowledge with scientific knowledge, to assure the flow of traditional knowledge to Environmental Impact Statement analysts, and to create an effective means of processing, holding, and using the information. Traditional knowledge research in future years may be proposed for other active Alaskan OCS areas.

Meeting the Need: The ESP currently has more than 32 ongoing social and economic projects, and there are at least 7 additional studies planned for Fiscal Year 1998.

- Research in the GOM is focusing on facility siting and the onshore effects of deepwater activities on both local and regional infrastructures, as well as new labor and migration issues.

- Studies in Alaska will center around melding traditional knowledge with western science in decision documents, subsistence issues, and disruptions to the Native Alaskan society.

- Additionally, collaborative planning with States and local governments is active in all regions, and is of continued importance in the Pacific Region.

- For all regions, developing and implementing a unified approach to regional economics, and a growing need for benefit valuations, will be addressed during the next several years.

- Plans are underway to begin looking at the effects of OCS activities on family structure and individuals.

- Research will be conducted to assess the benefits to GOM's economy from recreational fishing and diving around nearshore platforms, in order to anticipate what may happen when those structures are removed over the next 10 years.

- The near future will see an increased focus on the effect of the increased deepwater activities on GOM communities, social services, labor issues, ports, transportation, facility siting, and multiple use.

Oil-Spill Research Techniques

Objective: To improve MMS's estimates of oil-spill transport, fate, and impacts to the environment.

The MMS assesses oil-spill risks associated with offshore energy activities off the U.S. continental coast and Alaska. Analyzing the risk of oil spills contacting coastal and marine resources is part of the Environmental Impact Statement (EIS) process. This analysis addresses the likelihood of spill occurrence, the transport and fate of spilled oil, and the environmental impacts that might occur as a result of the spill. The MMS Oil-Spill Risk Analysis (OSRA) model combines the probability of spill occurrence with a statistical description of hypothetical oil-spill movement on the ocean surface.

Enactment of the Oil Pollution Act of 1990 has led to an increased emphasis on oil-spill research. Oil spills are one of the major areas of public concern with regard to offshore oil and natural gas development.

The MMS is committed to the continuous improvement of the OSRA estimations and EIS analysis, and it will use the results of field and modeling studies to fulfill that commitment. As offshore activity expands into deeper waters and new geographic areas, MMS oil-spill modeling will be applied to risk assessments and validated with environmental observations.

Meeting the Need: The studies to be funded under the ESP will improve the understanding of physical oceanography, oil-spill fates, and ecological impact processes.

- New studies of currents on the Gulf of Mexico continental slope in deep water will be undertaken to provide information for oil spill-risk analysis and model validation.

Future oil-spill research conducted under the ESP will include the following categories:

- **Ocean Transport** (physical oceanography) — observations of coastal and continental shelf currents acquired as part of field programs using current meters, drifting buoys, satellite images, and shipboard surveys. Data from these field programs will be used to validate computer models of ocean circulation.
- **Oil-Spill Fates** — laboratory analyses of various types of oil and computer modeling of the oil-spill behavior in the environment. Results of these analyses will be incorporated into oil weathering models.
- **Oil-Spill Impacts on Environmental Resources** — studies of the effects of oil on animal and plant resources. The ESP will conduct ecological monitoring to determine the effects of oil spills on marine communities.

- Studies of the fate, behavior, and cleanup of oil spills in the presence of sea ice in Alaskan waters will be needed.
- Additional modeling and field studies will be conducted to properly describe the fates and effects of well-stream materials discharged near the seafloor.

Air Quality Impact Assessment

Objective: To gather the necessary data and conduct analyses to evaluate impacts from OCS operations on air quality.

Under the authority of the Clean Air Act, the EPA carries out a rigorous program designed to improve the nation's air quality and to prevent significant degradation of air quality in areas that are relatively clean. The MMS works with the EPA and the States to assure that air emissions on the OCS do not hinder this effort. Through the ESP, the MMS provided much of the scientific data needed in support of these coordination efforts.

There is a continuing need to improve the science and gather additional data, especially as conditions change and new issues arise. The MMS will be augmenting its existing meteorological monitoring programs to get a better understanding of the atmospheric conditions that affect the movement and spread of air pollutants. This knowledge is important for improving the predictive models that are used to estimate what the pollutant levels will be and which areas will be affected.

Meeting the Need: The MMS Environmental Studies Program will further pursue cooperative efforts to evaluate any degradation of air quality in sensitive areas. The information generated will be used to determine if any actions are needed to minimize the degradation.

- Recently, the EPA promulgated revised standards for ozone particulate matter and regional haze. These will require collection of additional data, further studies, and increased cooperation with other Federal and state agencies.

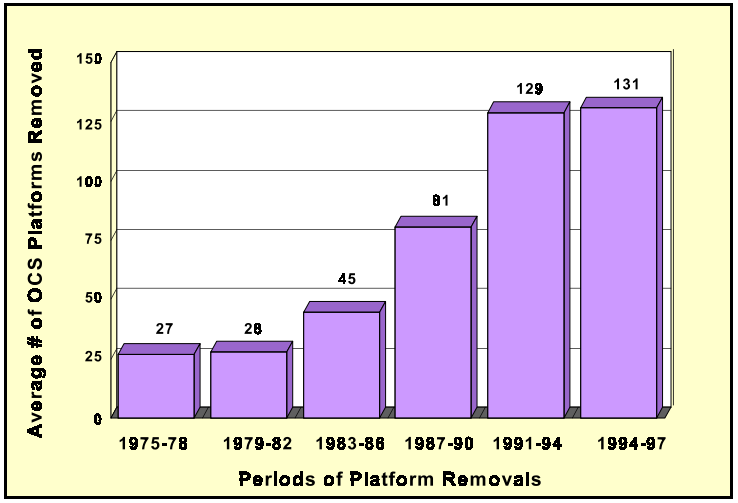
- In particular, the Breton National Wilderness Area in Louisiana will be the subject of a comprehensive study that will involve the MMS and other Federal Agencies, several States, and industry. Emissions, air quality, and meteorological data will be collected from both onshore and offshore areas. Predictive models will be applied to quantify the pollution levels over the area and their changes over time. Results will be used to determine if there has been degradation that exceeds the limits allowed under the Clean Air Act. Appropriate action may then be taken to remedy any significant degradation.

OCS Platform Decommissioning and Removal

Objective: To identify the impacts from full or partial platform removal and from depositing platform components offshore, to develop guidelines and processes for use during removal, and to ensure adequate cleanup afterwards.

Many oil and natural gas platforms and miles of associated pipelines located in the Gulf of Mexico and off the California coast are reaching the end of their service lives. As shown in the following figure, the average number of OCS platform removals is on the increase. The disposal of platforms offshore as artificial reefs has been viewed as a potential benefit as well as a hazard. Recent platform decommissioning and removals have raised concerns by local governments and local populations—specifically, by recreational and commercial fishermen who are concerned about the loss of fisheries and potential physical hazards.

Varying opinions exist on the benefits and drawbacks of a partial platform removal versus a complete removal. A partial removal consists of removing those portions of the structure that are located above the water's surface and some portion of the structure below the surface. For some, a good fishing spot remains; for others, an unseen hazard has been left behind. Even a complete removal without proper clearing of the ocean floor can cause hazards. These concerns challenge existing guidelines on the processes involved.



Average Number of Gulf of Mexico OCS Platform Removals, 1975-1997

Current technology available for platform removal includes bulk explosives, shaped explosive charges, mechanical cutters, and underwater arc cutters. Use of explosives is the most commonly used, safest, most cost-efficient, and most reliable method for severing piles and conductors of platforms. However, current technology surrounding

alternative severing techniques may require trading off safety, cost efficiency, and/or reliability.

The MMS has jointly sponsored several workshops to familiarize the public with the decommissioning process and to disseminate information on upcoming projects. Also, an internationally attended workshop was organized to address present decommissioning and removal processes and known related impacts. Workshop participants identified the values of ongoing practices and where and how improvements should be made.

Meeting the Need:

- ESP research will further address the environmental effects of platform removal on air quality, commercial/recreational fisheries, marine mammals, marine benthic organisms, and water quality.

- Long-term environmental and socioeconomic effects related to the disposition of oil and natural gas facilities will be addressed specifically for commercial and recreational fishing, habitat value of the facilities, use of platforms as artificial reefs, and onshore disposition.

Efficient & Effective Information Management

Objective: To increase the utility and usability of the MMS environmental research data.

Geographical Information Systems (GIS) technology holds great potential for monitoring and providing meaningful interpretation of the vast amounts of environmental data available. Traditionally, the ESP has collected data with the goal of providing a research report. With proper planning at the research level (i.e., those who collect, interpret, and use the environmental information), data can be collected in appropriate formats so that full advantage can be made of the existing and planned GIS tools.

An added benefit of GIS technology is the ability to view geographically not only the results of the environmental research, but also where the information exists. This can be done by utilizing the ESPIS, which has created databases that describe ESP research and has built an information base of electronic copies of the research. By adding geographic coordinates to the ESPIS information, planning of new research efforts will be aided by the ability to look at a "map" of where current information exists relative to planned activities. Locating research reports by clicking on a map presentation of the type and location of research would also be made possible. For example, one could easily view the coverage of bird, whale, human use, or other information by zooming in on North Carolina, the Florida Panhandle, Valdez, or Santa Barbara Channel. Another click on the map could then bring up a complete copy of the report that could be electronically searched for any needed information.

The GIS technology also enables the ESP to tap into data collected by many Federal and State agencies. Partnerships with these other agencies help reduce the MMS cost of data collection. Currently, much of the MMS's information management using GIS technology has been focused in the Gulf of Mexico Region. The Gulf-Wide Information System has developed a partnership between MMS, the Gulf States, industry, and NOAA to create a suite of coastal environmental information useful for oil-spill contingency planning and environmental assessments. The data collected and the GIS tools

developed as a result of this project are currently being evaluated for usefulness in environmental assessments. A goal of the ESP is to expand this technology throughout MMS.

Meeting the Needs: The ESP plans to increase the usefulness of its research as the volume and variety of environmental GIS data increase the capability and availability of tools. Several future initiatives will help MMS meet this need in a cost-effective manner:

- Develop standards for data collection to ensure that the data can be used by GIS tools. Although much has been accomplished for coastal data, similar data standards will be developed for deepwater environmental resources.

- Develop expertise in data management and GIS technology through pilot projects in the Regions and Headquarters. Some pilot projects being considered include:

  — linking OSRA results with environmental resource locations and environmental sensitivity index information,
  — collecting and storing California marine bird and nesting information in GIS-compatible databases,

  — collecting and storing Alaskan whale sighting information in GIS-compatible databases,
  — applying GIS technology to Gulf Coast environmental data for environmental analysis, and
  — geographically locating ESP research areas to enable GIS mapping and comparison of existing and planned research to existing and planned activities.

- Continue coordination with other Federal and State agencies that are collecting environmental information in GIS format to identify opportunities for leveraging funds.

MMS Marine Minerals Activities

Objective: To understand the environmental impacts of OCS sand and gravel dredging and beach renourishment.

Prior to Public Law 103-426, enacted October 1994, hard mineral resources could only be obtained through a competitive lease sale process stipulated under the OCS Lands Act. Presently, leases for approved public works projects can also be issued on a noncompetetive basis. The Department of the Navy and Duval County, Florida, have already used Federal sand for beach nourishment purposes. Other local and State governments, as well as Federal Agencies, are currently pursuing agreements to extract marine mineral resources on the OCS for use as beach renourishment material. The Federal OCS also represents a future source of construction aggregate material.

Public Law 103-426, October 1994, as amended by the Outer Continental Shelf Lands Act, provides the Secretary of the Interior with new authority to negotiate agreements for use of Federal sand, gravel or shell resources under certain circumstances.

These projects have generated a need for technical information and environmental studies to ensure that offshore minerals are developed in a safe and environmentally sound manner. The MMS's

Office of International Activities and Marine Minerals (INTERMAR) has been developing and procuring contracts to provide needed information regarding environmental management of these resources.

Cumulative physical and biological effects associated with the dredging of offshore borrow areas are likely to be encountered over the expected life cycle of a beach nourishment project. Continuous dredging within the same area could lead to permanent changes in the habitat or structure of benthic biological organisms, which represent the principal source of food for many water-column-dwelling species. Spawning grounds for fish or other marine species may also be at risk because of major and, possibly, permanent changes in the character of the bottom substrate or bottom sediment grain size. Dredging continuously within the same area may also modify the bathymetry such that adverse changes in the local wave and current regime may occur.

The generic and site-specific studies that are being funded or are proposed to be funded by ESP provide a solid foundation on which the MMS can make sound environmental decisions relative to marine mineral development.

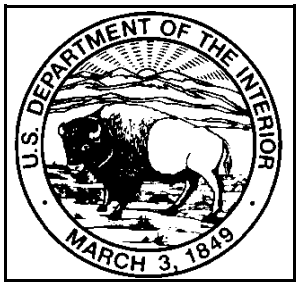
Meeting the Need: The MMS marine minerals program will concentrate on developing generic studies to provide useful information for decisionmaking in all of the regional areas.

- Proposed research addresses cumulative biological and physical effects of dredging within the same borrow area over the lifetime of an intended renourishment cycle.
- Studies are also planned to continue cooperative research with the United Kingdom to assess various impacts associated with the extraction, development, and transportation of offshore construction aggregate.

To date, two general categories of studies have been developed and supported by ESP funds to address marine mineral-related issues.

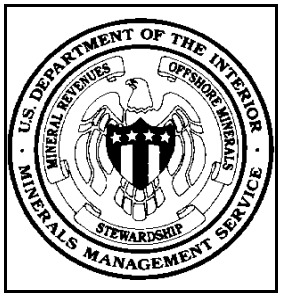
- ✦ generic field or literature studies to examine the effects of particular types of mining operations on various aspects of the physical, chemical, and biological environments; and
- ✦ site-specific environmental studies in areas where offshore mineral activities are actually proposed or appear likely in the near future.

Studies proposed for Fiscal Year 1999 will address the full range of cumulative physical and biological effects of offshore dredging activities associated with both beach nourishment and construction aggregate operations.



The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Royalty Management Program** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.